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Religion, perceptions, and behavior during the corona/COVID-19 pandemic among university students in Malawi

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Abstract

This study investigates the covid risk perceptions, information updating behavior related to the pandemic, use of protective measures, especially facemasks, and the demand for vaccines among university students in Malawi. In particular, the study focuses on how religion and belief in prayer as a protective device against covid-19 are affecting perceptions and behavior related to the pandemic. Our findings are from a stratified random sample of 764 students from 48 classes spread across different disciplines and study years for both undergraduate and postgraduate. One-tenth of the students believed that prayer was their most important measure to protect themselves against the pandemic. Students belonging to the Seventh Day Adventists (Baptist) and Pentecostal religions perceived the covid risk to be significantly lower than other students. Students that considered prayer to be the most important protective device also perceived the covid risk to be lower than others; and updated themselves significantly less frequently about the status of the pandemic than other students. Whereas students that perceived their personal health to be at risk updated themselves more frequently about the pandemic. The information updating frequency related to the pandemic and covid risk perceptions were positively correlated with facemask use, including facemask use in church. Those who believed in prayer as a protective device were using facemasks less frequently. Students belonging to the Seventh Day Adventists and Pentecostals were less likely to use facemasks in church. These two student groups represent close to 30% of our sample; and these two groups are less likely to have tried to get vaccinated or having gotten vaccinated. These two groups are therefore at higher risk themselves in future corona waves and may also, due to their beliefs and behavior enhance the spread of the virus. Our findings may be useful for targeting efforts to promote more corona safe behavior.

Key words: Corona, COVID-19, pandemic, university students, religion, behavior.

JEL codes: I12; I15; I18.

Highlights

- *The study is based on data from a stratified random sample of 764 undergraduate and postgraduate university students of 48 classes of diverse disciplines and study years in Malawi.*
- *The study focuses on how religion and belief in prayer as a protective device are affecting perceptions and behavior related to the pandemic.*
- *Believers of prayer as a protective device and students belonging to two religious groups account 30% of student samples.*
- *These groups of students are less likely to use face masks, to have tried to get vaccinated; are at higher risk themselves in future corona waves.*
- *They may also, due to their beliefs and behavior enhance the spread of the virus; there is need for efforts to promote more corona safe behavior.*

1. Introduction

The global pandemic caused by new mutations of the coronavirus has caused severe disease (COVID-19) and deaths all over the world, including in Africa. Africa appears to have been the least affected region in the world at early stages of the pandemic and this has been explained by demographic and climatic factors but could also be due to under-reporting due to weak systems for testing and reporting of disease in African countries (Aduh et al., 2021). Africa is lagging far behind the rest of the world in terms of covid vaccination status in 2022 when our study in Malawi took place and Malawi is no exception from this with an estimated 4.5% of the population fully vaccinated by May 1st, 2022. This implies that compliance with precautionary measures is the main way of protecting oneself against the risk of infection. Our study focuses on covid risk perceptions, adoption of precautionary measures and demand for covid vaccination among university students in Malawi.

Risk perceptions of individuals in form of their judgement and evaluations of hazards to which they may be exposed, including the social phenomena related to exposure, the risk of disease, and the health outcomes are essentially subjective when there is limited objective information available and accessing such information is costly (Teasdale et al., 2014; Yang et al., 2017). Covid risk perceptions are likely an important determinant of the adoption of precautionary measures to reduce the risk of infection and disease. If the covid risk perception is low, this is likely also to have a negative effect on the adoption of precautionary measures and demand for vaccines. Covid risk perceptions may be influenced by

multiple factors including cultural norms and religious beliefs. With low adoption of precautionary measures, the spread of the disease will be faster. Persons who perceive the risk to be low and who therefore do not adopt precautionary measures, can also, if infected, not only face a higher risk of getting infected and sick themselves but also represent a higher social risk as they may infect many others.

A university is where students with different backgrounds meet science and where their cultural norms and beliefs are confronted with scientific knowledge. However, religious affiliation and religious beliefs, where these are strong, may not easily be overruled by scientific ideas where these can have contradicting influences on perceptions and behavior such as is the case of the corona/COVID-19 pandemic. Especially one religion group in Africa, the Pentecostals, are known to have taken a strong position related to the corona pandemic. The late Tanzanian President, John Magufuli, who was a Roman Catholic with Pentecostal ties, agitated for an inclusive spiritual warfare against the pandemic, including people of all faiths to participate in a three-days national prayer (Kirby et al., 2020). The belief in prayer as a protective device against the pandemic may therefore go across religions. Prominent have also been some Pentecostal pastors in Zimbabwe as advocates of spiritual warfare against the pandemic which is seen as a 'spiritual force of evil' rather than a biomedical risk. Such beliefs may imply non-compliance with publicly recommended precautionary measures such as use of facemasks, social distancing, handwashing, and avoidance of crowded places. In our study we investigate whether such religious affiliations and beliefs may influence Malawian university students' behavior related to the pandemic. Malawi has a number of religions and each of the religious groups are connected across African countries. Malawi is therefore an interesting country to study to assess the extent of variation in covid related behavior across these religious groupings and to assess whether such belief differences persist among university students and influence their behavior related to the pandemic. A sociological study by Baker (2008) focused on the relationship between prayer and health outcomes based on a national random sample in the US. A relevant and interesting finding was that women and African-Americans, and people with lower income used prayer more, and were more likely to use prayer to ask God to influence their personal health. Prayer may therefore be used as an alternative coping mechanism, and we investigate to which extent it is considered as a substitute to officially recommended protective measures against COVID-19

Vaccine hesitancy is a widespread phenomenon in many developed countries, such as the United States, as well as in some developing countries, such as Malawi, that our study focuses on. In Malawi vaccine hesitancy is related partly to religion and a recent qualitative study in urban areas of the country found rumors and beliefs that the covid vaccine can lead to infertility among women (Kateta, 2021). This belief could cause women to have less trust in the vaccines and this could lead to a gender inequality in vaccination. Kateta (2021) also provides anecdotal evidence that members of the Pentecostal church in Malawi have been made to believe that COVID-19 and its vaccines are from 'the devil and his underworld'.

In this study we assess the impact of religion on the belief in prayer as a protective device against covid, their impact on covid risk perceptions, on information updating behavior related to the pandemic, and protective measures to reduce the personal risks of corona virus infection and COVID-19 disease among Malawian university students. About 10% of our student sample ranked prayer as the most important protective measure against the pandemic among all the protective measures identified in our sample. Prayer may for such students represent a substitute for other protective measures. We assess a) whether belief in prayer as a protection method leads to or is correlated with a lower facemask use score and demand for vaccination; b) whether facemask use in church is varying systematically across Christian sub-religions and whether it is affected or correlated with covid risk perceptions and information updating behavior related to the pandemic; c) how demand for covid vaccination is influenced by the type of religion the students belong to, assuming that this is a predetermined variable that has not been influenced by the pandemic. The effects of religion on facemask use score and demand for covid vaccination may or may not go through the covid risk perceptions and belief in prayer as a protective measure. We investigate the direct and indirect effects or correlations, acknowledging that a correlation is no proof of a causal effect although it may be indicative of a likely causal relationship based on our conceptual model of hypothesized causal relations.

We find many significant correlations that are consistent with our conceptual health-belief-perception-behavior model. We find significant differences between religious groups in the view of prayer as a protective measure, the subjective covid risk perceptions, information updating behavior, and how these affect demand for covid vaccination and general use of facemasks, and in particular facemask use in church. Our findings have implications for how the Malawian society should enhance the motivation to vaccinate its population against COVID-19 and better protect itself against new waves of the pandemic.

The paper is organized as follows. Section 2 outlines the survey design. Section 3 presents our conceptual framework. Section 4 provides a variable description and some descriptive statistics for the key variables of interest. Section 5 explains our statistical methods used in the analysis. Section 6 presents the results.

2. Survey design

We used a stratified random sample design. First, we obtained an overview of all study programs in the university with a list of all students in the different programs by year of study and study campus. We identified classes with more than 16 students across different study programs. We randomly sampled 16 students from such classes. In total we collected data from 48 classes and 764 students. The largest share of the sample is from the Bunda Campus (87%), and the remaining sample comes from the City Campus. We aimed to have a broad coverage of study programs and years of study in each study program. We tried to find first to fourth year BSc-students as well as MSc-students. We found

difficulties in recruiting classes of MSc-students for the study as they were mostly out of the campus during our study. The exceptions from the standard sample of 16 students per class were one BSc-class with only 12 participants and two MSc-groups which were composed from several MSc-classes. The study disciplines included Agribusiness Management, Agricultural Economics, Gender and Development, Agricultural Extension, Agricultural Sciences, Veterinary and Animal Sciences, Environmental and Natural Resource Management, Engineering and Biotechnology Sciences, Food and Nutrition Sciences, including more specialized studies within these areas. In this paper we focus primarily on religion and its influence on the perceptions, beliefs, and behavioral responses of students during the pandemic. We therefore use class fixed effects to control for academic influence (effects of study program and year of study).

We designed a survey instrument that was programmed in the Survey Solutions software and used tablets for the data collection where the students themselves answered the questions on the tablets handed out to them while being seated in a classroom.

Each session was organized under corona safe conditions as the survey took place during the fourth wave of the pandemic in the country. Both the researchers and students had to use facemasks throughout the sessions. The classroom was big enough to allow the seating of 16 students on numbered desks with sufficient distance of not less one meter in between. One researcher was leading each session and guided the students through to ensure that all were on the same page, gave standardized introductions to the different parts and made sure the students did not communicate with each other but focused on giving their personal responses without distractions.

The main parts of the survey instrument focused on their knowledge about the corona pandemic, their perceptions related to the pandemic, vaccination and infection status of students, personal behavior in response to the pandemic, and their perceptions about the behavior of other students related to the pandemic. The survey instrument also included questions about personal and family characteristics, ethnicity, religion, and personal interests, see the Appendix.

3. Conceptual framework

We present a simple conceptual framework in Figure 1. We hypothesize that religion influences both covid risk perceptions and belief in prayer as a method to protect oneself against getting infected and becoming sick. However, the religious affiliation may also represent a cultural norm that has more direct implications for how people belonging to different religious groups behave in relation to the pandemic such as related to attitudes towards vaccination and use of facemasks, including facemask use when inside their church or mosque. We hypothesize that a) certain types of religions have stronger beliefs that their religion protects them against the covid risk; b) certain religions (e.g. Pentecostals) may have

a stronger belief that prayer can protect them against getting infected and sick; c) women are more likely to believe in prayer as a protective device against COVID-19 (Baker 2008;); d) the belief in prayer as a protective measure reduces the perceived need to update oneself on the pandemic; e) the belief in prayer as a protective measure reduces the facemask use score; f) the belief in prayer as a protective measure reduces the trust in vaccines and demand for vaccination; g) facemask use is less common in church for certain types of religions. Based on what Kateta (2021) reported, we hypothesized that h) female students are less likely to (try to) vaccinate themselves against covid than male students (as they may fear side-effects from vaccination). Furthermore, we hypothesize that i) more frequent information updating is associated with higher demand for vaccination and j) more use of facemasks.

Our hypothesized causal mechanisms are illustrated in Fig. 1 with arrows and + and – signs.

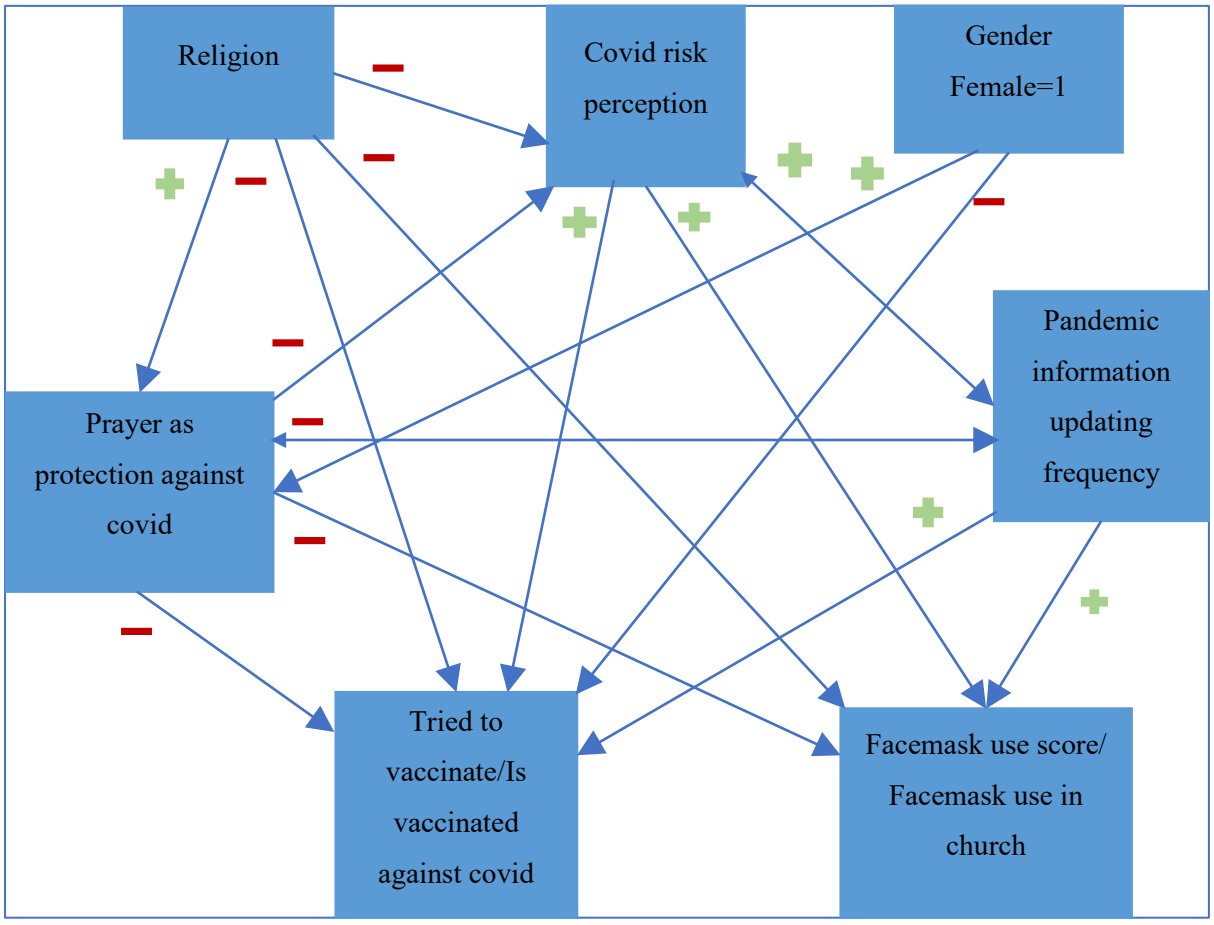

Fig. 1. Hypothesized influence of religion on covid risk perceptions and behavior related to the pandemic

4. Variable description

Table 1 gives an overview of key variables of interest. The variable 'Corona risk perception' was formed based on the question 'Do you perceive COVID-19 represents a serious risk to your personal health?' and answers were categorized as 1=Yes, 2=Don't know, and 0=No. We asked the students how often they updated themselves on the status of the pandemic during the last wave and categorized the answers as 1=Daily, 2=Weekly, 3=Monthly, 4=No efforts made, 5=Expect others to inform me. After reordering 4 and 5, the variable 'Information updating category' is used, see Table 1 and Fig. 2a. It is transformed to a simple information updating frequency = 1/Information updating category. This gives a variable with values between 0.2 and 1.

The 'facemask use score' variable was constructed based on the frequency (0=Never, 1=Sometimes, 2=Always) of facemask use in nine different types of locations (In stores/shops, at friends' home, in the street, in the bus, in the market, at home, in the university, in the classroom, in church) by summing the frequency score across the nine types of locations for each student. The maximum score then becomes 18. The distributions across locations are presented in Table 1 and the distribution across students is presented in Fig. 2b.

About half of the students use face masks always in the university while close to 60% use facemask always when in church.

Table 1. Personal behavior in response to the pandemic: Facemask use frequency by location type

Location	Frequency		
	Always	Sometimes	Never
In stores/shops	72.1	27.6	0.3
At friends' home	29.6	53.8	16.6
In the street	55.5	39.9	4.6
In the bus	75	23.6	1.4
In the market	66	31.4	2.6
At home	9.2	40.6	50.3
In the university	44.8	55	0.3
In the classroom	54.8	44.4	0.8
In church	59.8	34.6	5.6

The students were asked to rank the three most important methods they used to protect themselves against being infected by the corona virus. Table 2 presents the aggregated rank score distributions for the different protection methods. We see that by far the use of facemasks is considered the most important method. Note however, that as much as 10% of the students ranked praying to God as the most important method to protect themselves against infection while few ranked it as the second or third most important protective measure. Table 3 provides some more statistics for key variables.

Table 2. Rank distributions for the three most important methods used to protect against getting infected by the corona virus

Protection method	Rank frequency (% of 764 students)			
	1	2	3	Not
Used facemask	52.9	17.9	10.9	18.3
Kept > 1 meter distance in public places	7.6	21.1	14.8	56.5
Reduced number of contact persons	3.7	5.1	6.2	85.1
Washed hands many times per day	6.2	18.1	21.6	54.2
Avoided handshakes	0.9	5.2	5.8	88.1
Avoided crowded places	14.9	15.7	15.7	53.7
Used disinfectants regularly	1.8	10.5	15.1	72.6
Prayed to God to not get infected	10.0	0.7	3.4	86.0
Used traditional medicine	0.9	0.8	0.9	97.4

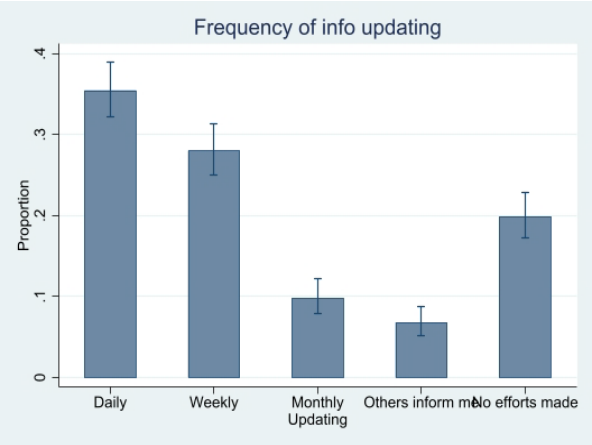

Fig. 2a. Frequency of updating information

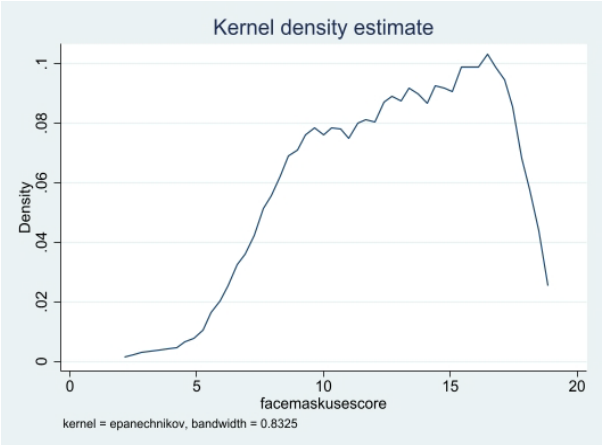

Fig. 2b. Facemask use score distribution

Table 3. Summary statistics for key variables

Key variables of interest	Mean	Share	Median	Std. Dev	N
Corona risk perception=0		0.114			764
Corona risk perception=1		0.082			764
Corona risk perception=2		0.804			764
Information updating category	2.48		2	1.51	764
Information updating frequency	0.58		1	0.33	764
Facemask use score	12.84		13	3.49	764
Facemask use in church=0=Never		0.047			658
Facemask use in church=1=Sometimes		0.401			658
Facemask use in church=2=Always		0,599			658
Tried to vaccinate/Is vaccinated	0.46		0		764
Is vaccinated	0.28		0		764

Table 4 shows the distribution of religious affiliations among the students in our sample. Some religions are represented with few students and these, such as Anglicans, Jehova's Witnesses, Mormons, and the 'No religion' categories should not be given too much weight in the analysis even if they come out as statistically significant in an analysis. Still, we have kept them in the sample in most of our analyses for completeness of the assessment. An exception is the analysis of facemask use in church which we conducted only for those that belong to a Christian religion. We are not sure that the students interpreted "church" as their religious building in the case they belong to a non-Christian religion.

Table 4. Sample distribution by religion

Religion	Freq.	Percent
Roman Catholic	161	21.1
Anglican	13	1.7
Seventh Day Adventist/Baptist	117	15.3
Central African Presbyterians	239	31.3
Pentecostal	110	14.4
Jehova's Witnesses	15	2.0
Mormon	3	0.4
Sunni Muslim	26	3.4
No Religion	6	0.8
Other	74	9.7
Total	764	100.0

5. Methods

We rely on self-reported data from the student subjects and cannot rule out that there are discrepancies between real behavior or perceptions and reported behavior and perceptions, but we explained carefully that all information would be anonymized such that the students should not fear to give their honest responses. It is possible that some students pretended to behave more responsibly related to the pandemic than in reality. Since they filled the answers on a tablet, they did not have to explain their responses through face-to-face interviews, and this may have reduced the risk of such interviewer bias. Furthermore, we see no strong reasons for strategic answering by the students given our instrument design. We therefore regard the data as reliable.

We used simple linear panel data models for the analysis. As the academic influence on students' beliefs, perceptions, and behavior do not represent our key variables of interest in this research, we use class Fixed Effects to control for their influence in our models with the key variables of interest that focus on religion, beliefs, perceptions and stated behavior. We used dummy variables for each religion and used the Roman Catholic group as the base category in our analyses as this is one of the largest religions in the country. Many of the key variables of interest as dependent as well as independent variables are categorical variables, but we follow the advice of Angrist and Pischke (2008) and use simple linear models even in the cases when the dependent variables are categorical as such models

give good estimates of average marginal effects even though they may be less efficient than certain non-linear models.

We may look at the pandemic as a natural experiment and the exposure to it may to a large extent be random. However, the rational (and irrational) responses to the pandemic may be affected by the beliefs and knowledge acquired by students in response to its occurrence. Religious beliefs and religious affiliations are assumed to be predetermined but interact with the exposure and information updating behavior of the students. This implies that perception and behavioral variables are endogenous, but we assume the influence goes from the predetermined religion and basic belief (prayer as a protective measure against covid) towards covid risk perceptions and information updating behavior, which again influence or are correlated with other protective measures such as facemask use and vaccination behavior.

We face challenges in identifying valid and strong instruments to control for endogeneity bias and therefore rely on cautious interpretation of the correlated effects found in our econometric models. We compare the statistical findings with our conceptual framework and the hypotheses this framework suggests with + and – signs in Fig. 1. We can assess whether the statistical correlations are consistent with the hypotheses or not and thereby whether the statistical model support or do not support the relations suggested by the conceptual framework. We argue more strongly in direction of a likely causal effect when it is conceptually difficult to claim otherwise. We cannot rule out biases due to endogeneity (omitted variable bias) or non-linearities but think that the estimated marginal effects are reasonably reliable for the religious affiliations that are represented by large enough samples give reasonably precise estimates.

6. Results

We use a set of models with group fixed effects (FE) to control for academic variation and class influences while we used religion dummy variables to assess the differences in responses among students depending on their religion affiliation.

In particular, we assessed whether the belief in prayer as a protective device, covid risk perceptions, the information updating frequency, demand for vaccination, and facemask use differed systematically across religious affiliations. In the first model in Table 5 and Fig. 3a, we assessed whether the belief in prayer to protect oneself against covid differs significantly across religions and by gender. We had no preconceived hypotheses about for which religions prayer could be assigned such a protective power. The results show that such a belief is significantly more common among the Pentecostals than for the Roman Catholic, but also for the Roman Catholic such a belief was significant as evidenced by the significant constant term. Women were also significantly more likely to rank prayer as one of the most

Table 5. Religion, pray to protect against covid, covid risk perceptions, and information updating behavior

	Pray to protect rank	Covid risk perception	Info updating frequency
Religion: Base: Roman Catholic	0	0	
Anglican	0.297	-0.241	
	(0.327)	(0.190)	
Seventh Day Adventist	0.037	-0.222***	
	(0.098)	(0.075)	
Central African Presbyterians	0.030	-0.0221	
	(0.073)	(0.070)	
Pentecostal	0.333***	-0.190**	
	(0.124)	(0.088)	
Jehova's Witnesses	-0.199	-0.345	
	(0.119)	(0.268)	
Mormon	0.966	0.233*	
	(0.890)	(0.134)	
Sunni Muslim	-0.032	0.162*	
	(0.136)	(0.092)	
No Religion	-0.383**	-0.322	
	(0.148)	(0.392)	
Other	0.100	-0.084	
	(0.132)	(0.092)	
Pray to protect=0		0	0
Pray to protect=1		-0.003	-0.036
		(0.134)	(0.063)
Pray to protect=2		-0.423	-0.05
		(0.301)	(0.150)
Pray to protect=3		-0.221**	-0.116***
		(0.092)	(0.041)
Sex	0.149**	-0.011	
	(0.072)	(0.051)	
Covid risk perception =0			0
Covid risk perception =1			0.030
			(0.050)
Covid risk perception =2			0.153***
			(0.036)
Constant	0.216***	1.802***	0.472***
	(0.050)	(0.045)	(0.032)
Observations	764	764	764
R-squares, within	0.030	0.04	0.046
R-squares, between	0.000	0.007	0.109
R-squares, overall	0.027	0.037	0.05
Wald Chi2	4.0	3.0	7.4
Prob > chi2	0.0005	0.0026	0.0000

Note: Models with class fixed effects. Cluster-robust standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

important protective devices. Not surprisingly, those without a religion had a significantly lower belief in prayer as a protective device than the average Roman Catholic. Fig. 3a also illustrates the variation in precision of the estimates across religions due primarily to their varying sample sizes.

The second model in Table 5 and Fig. 3b show the results for the covid risk perception model where the religion and belief in prayer as a protective device against covid are included as right-hand side (RHS) variables. This implies that we allow the effect of religion to be both direct and indirect through the belief in prayer as a protective device. Table 5 shows that Seventh Day Adventists and Pentecostals

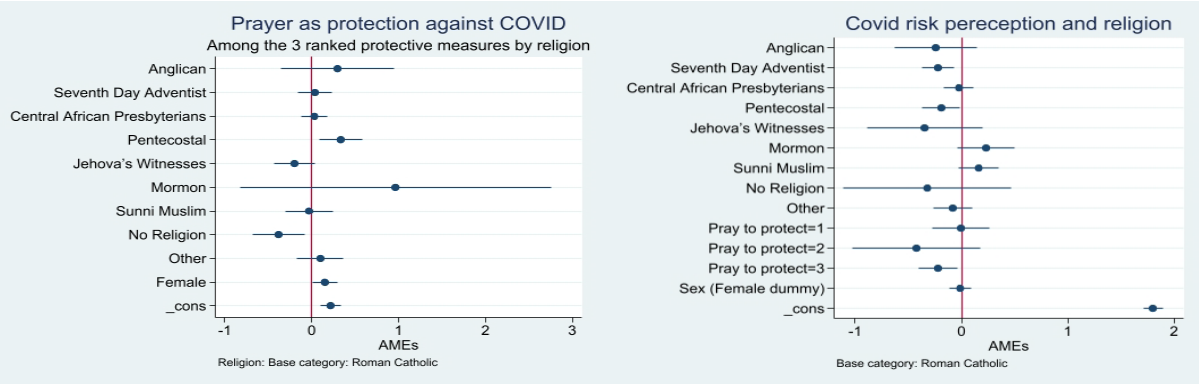

Fig. 3a. Belief in prayer as a protective measure. Fig. 3b. Covid risk perception by religious affiliation.

had a significantly lower covid risk perception than the base category (Roman Catholic). In addition, we see that those that ranked prayer as the most important protective device against covid also had a significantly lower covid risk perception than the average Roman Catholic. We remember that the Pentecostals also were the ones with significantly stronger belief in prayer for protection and these combined effects may cause them to be substantially less fearful related to the pandemic. We note, however, that the average covid risk perception value for the Roman Catholic of 1.8 is quite high and indicating that most of them take the risk seriously.

In the last model in Table 5 we assessed how the covid risk perceptions and the belief in prayer as a protective device affected the information updating frequency related to the pandemic among the students. Like we hypothesized in the conceptual framework, higher risk perception leads to or is associated with more frequent information updating (highly significant positive result). Likewise, a strong belief in prayer as a protective device (ranked as the most important protective device) is associated with a highly significant lower information updating frequency. We rule out that the second result is due to reverse causality while we cannot rule out at least a partial reverse causality (chicken-egg relationship) for the first result as it is possible that more intensive information collection can enhance (or reduce) the covid risk perception.

In the first model in Table 6 and Fig. 4a we assess correlations between the facemask use score and religion, belief in prayer as a protective device, covid risk perceptions, and information updating frequency. This allows us to assess whether religion has a direct effect beyond the effects through the other included (endogenous) variables. In our conceptual framework we hypothesized that a stronger covid risk perception and more frequent information updating are causing or is associated with a higher facemask use score, while the belief in prayer as a protective device reduces intensity of facemask use directly (as a substitute) or indirectly through the perception of a reduced risk and less frequent information updating. The results indicate that the effects from religion primarily go through the other (endogenous) variables which all are highly significant. The facemask use score is strongly positively correlated with covid risk perception>0 and information updating frequency and strongly negatively

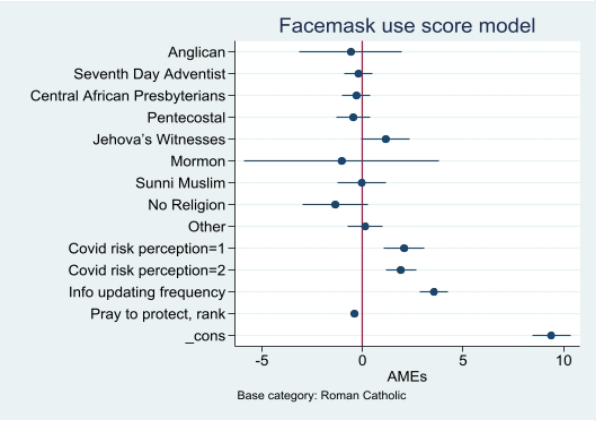

Fig. 4a. Facemask use score model results

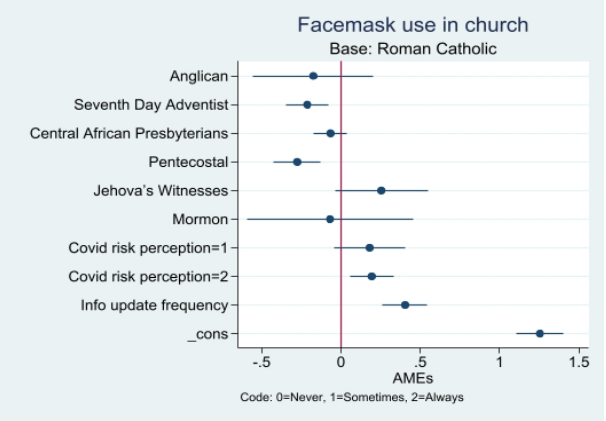

Fig. 4b. Facemask use in church model results

correlated with belief in prayer as the most important device to protect oneself against covid. These results are consistent with the hypothesized signs we proposed in the conceptual framework.

In the second model in Table 6 and in Fig. 4b we assessed the correlation between facemask use in church and religion, covid risk perception, information updating frequency and prayer as a protection device but only for the sub-religions that have a church as their religious building. This implies that we omitted Sunni Muslims, those with no religion and the 'Other religion' categories. We see that there are strong direct effects for Seventh Day Adventists and Pentecostals that are significantly less likely to use facemasks in church than the Roman Catholic base category. We also see that higher covid risk perception is associated with significantly more facemask use in church. Likewise, those with a higher information updating frequency were significantly more likely to use facemask in church. The pray to protect variable was insignificant in this model.

Finally, we assess the demand for vaccination models where the dependent variable is a dummy variable for whether the students have actively tried to get vaccinated/are vaccinated or a dummy for whether they actually succeeded to get vaccinated. In a country with limited distribution of vaccines the actual vaccination status may not be a very good indicator of the demand for vaccination. Therefore, we think

the first model that combined those who stated they have tried to get vaccinated with those that succeeded to get vaccination is the best model for us to assess our hypotheses. Both models are presented in Table 7 and in Fig. 5a and 5b.

Table 6. Facemask use score and facemask use in church among Christians by type of church

	Facemask use score	Facemask use in church
Religion: Base: Roman Catholic	0	0
Anglican	-0.575	-0.167
	(1.270)	(0.188)
Seventh Day Adventist	-0.204	-0.212***
	(0.339)	(0.065)
Central African Presbyterians	-0.302	-0.065
	(0.343)	(0.052)
Pentecostal	-0.455	-0.266***
	(0.424)	(0.075)
Jehova's Witnesses	1.153*	0.242*
	(0.602)	(0.143)
Mormon	-1.04	-0.034
	(2.408)	(0.285)
Sunni Muslim	-0.0369	
	(0.594)	
No Religion	-1.348*	
	(0.801)	
Other	0.132	
	(0.440)	
Covid risk perception=0	0.000	0
Covid risk perception =1	2.082***	0.163
	(0.500)	(0.109)
Covid risk perception=2	1.912***	0.183***
	(0.379)	(0.067)
Info updating frequency	3.550***	0.391***
	(0.358)	(0.071)
Pray to protect against covid	-0.396***	-0.0371
	(0.091)	(0.023)
Constant	9.379***	1.281***
	(0.474)	(0.076)
Observations	764	658
R-squares, within	0.206	0.12
R-squares, between	0.383	0.228
R-squares, overall	0.221	0.128
Wald Chi2	17.1	11.9
Prob > chi2	0.0000	0.0000

Note: Models with class fixed effects. Cluster-robust standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Table 7. Covid (demand) vaccination models

	Tried to/Is vaccinated	Is vaccinated
Religion: Base: Roman Catholic	0	0
Anglican	-0.138	-0.184
	(0.164)	(0.118)
Seventh Day Adventist	-0.159**	-0.144**
	(0.064)	(0.054)
Central African Presbyterians	-0.053	-0.035
	(0.060)	(0.057)
Pentecostal	-0.111*	-0.094
	(0.066)	(0.069)
Jehova's Witnesses	0.206*	0.276*
	(0.120)	(0.144)
Mormon	0.054	0.194
	(0.318)	(0.303)
Sunni Muslim	-0.276***	-0.110
	(0.094)	(0.082)
No Religion	0.124	0.334
	(0.305)	(0.282)
Other	-0.098	-0.121*
	(0.070)	(0.070)
Covid risk perception=0	0	0
Covid risk perception=1	-0.055	-0.111
	(0.085)	(0.077)
Covid risk perception=2	0.073	-0.051
	(0.061)	(0.055)
Info updating frequency	0.126**	0.081
	(0.059)	(0.050)
Pray to protect against covid	-0.062***	-0.050***
	(0.017)	(0.015)
Sex (Female dummy)	-0.060	0.025
	(0.046)	(0.045)
Constant	0.450***	0.343***
	(0.072)	(0.065)
Observations	764	764
R-squares, within	0.068	0.054
R-squares, between	0.025	0.002
R-squares, overall	0.065	0.048
F-value	6.3	4.8
Prob > F	0.0000	0.0000

Note: Models with class fixed effects. Cluster-robust standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

The first model in Table 7 shows that the Seventh Day Adventists, Pentecostals, and Sunni Muslims were significantly less likely to have actively demanded to get vaccinated. Those who ranked Praying as the most important device to protect against covid were also significantly less likely to have actively

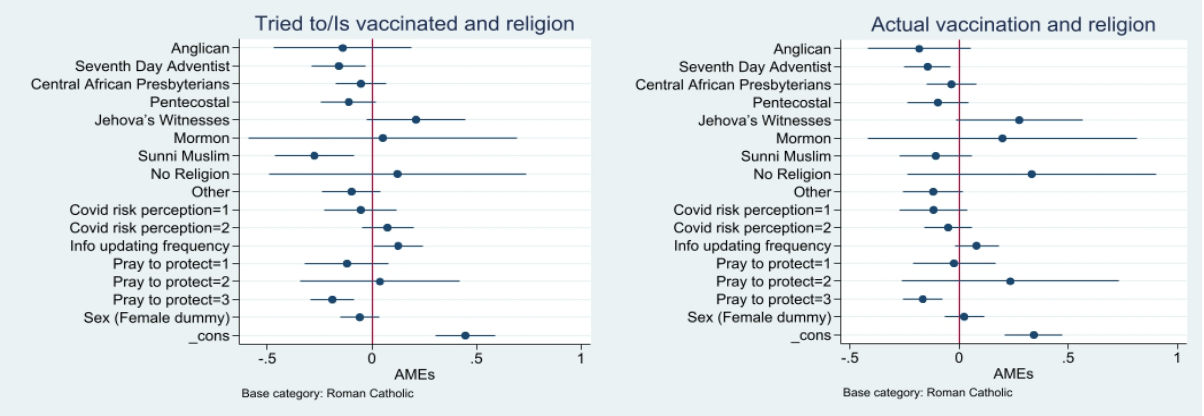

Fig. 5a. Tried to vaccinate/Is vaccinated model. Fig. 5b. Is vaccinated model.

tried to get vaccinated. We also remember that the Pentecostals were more likely to believe in prayer as a covid protection device such that the effect of this religion is direct as well as indirect in the model. Those who had a higher information updating frequency were significantly more likely to demand vaccination and this information updating effect is also endogenous and partly influenced by the belief in prayer as protection, pointing towards a direct and two indirect routes for the negative effects of religious affiliation on the demand for vaccines.

Unlike what we hypothesized we did not find a significant negative effect of gender on the demand for vaccination. However, it is possible that the gender effect goes primarily through their stronger belief in prayer as a protective device as prayer was highly significant in both the vaccination models. Still, tt seems that the infertility belief reported by Kateta (2021) is not common among the female students in our student sample. Surprisingly, we also found no significant correlation between the covid risk perception and the active demand for vaccine or the actual vaccination status. The results for the model with the actual vaccination status were very consistent with the active demand for vaccination model although there were some discrepancies in the significance levels.

7 Discussion

As much as 80% of our student sample responded that covid represents a serious risk to their personal health. Our study demonstrates that religious beliefs remain important among university students in Malawi and that such beliefs have a significant influence on the pandemic-related risk perceptions and the protective measures taken by the students. Chirwa et al. (2021) found that the perceived covid risk reduced the participation in the June 2020 presidential election in Malawi. Our study shows that certain religious beliefs were negatively correlated with covid risk perceptions and covid risk perceptions were positively correlated with the use of facemasks. These findings are consistent with our hypotheses about causal relations related to the risk perceptions in the conceptual framework and are well founded in the literature (Aduh et al., 2021; Dryhurst et al., 2020). Religious fatalism may also play a role and reduce

the compliance with protective measures against covid. However, it is not obvious how such fatalism may work as it may not rule out private action to protect oneself (Franklin et al., 2007; Hag Hamed et al., 2019). We did not investigate the extent of fatalistic attitudes in our sample and cannot therefore assess its influence.

In line with insights from Tanzania and Zimbabwe (Kirby et al. 2021), the students belonging among the Pentecostals were more likely to regard prayer as the most efficient device against covid and had a lower covid risk perception than other groups. They were also less likely to use facemasks in church. Belief in prayer as a protective device was also strongly related to a lower demand for vaccination. This shows that these beliefs are common even among university students in Malawi and they have implications for covid-related behavior. This indicates that academic influence is insufficient to change such religious beliefs and public programs need to work through religious leaders in the different religions to enhance compliance with the recommended protective measures and to promote more widespread vaccination when more vaccines are made available. 28% of our student sample had been vaccinated already, and this is much higher than the average number for the country. 46% had tried to get vaccinated, or were vaccinated already.

We found that women were significantly more likely to believe in prayer as a protective device against covid. This is consistent with findings in the US when it comes to the belief in and use of prayer to protect oneself in health-related issues that is especially common among African-Americans and women (Baker 2008; Ellison and Taylor 1996). Unlike Kateta (2021) we did not find any evidence that female students were less willing to get vaccinated than male students. This may imply that the belief that covid and the vaccine are associated with infertility of women have not taken root among the female students in our study.

The corona pandemic has severely impacted the individual freedom although such restrictions have varied a lot across countries as well as over time with the varying severity in terms of risks of infection and of serious disease associated with the different waves of the pandemic, the virus variants, the shares of populations that have been vaccinated, and based on the anticipated protection the number of doses of the vaccines give. Political leaders in Malawi were reluctant to impose restrictions during their campaigns before the 2020 elections and religious leaders were unwilling to postpone religious rituals in churches while such restrictions were imposed in many other countries.

Perry et al. (2020) suggested that those who refused to recommend protective measures against the pandemic in the US were more driven by an anti-science ideology than religious beliefs. This anti-science ideology is associated with a conception of Americans as God's chosen and protected people, distrust in news media, and allegiance to Trump-Christian nationalism. Perry et al. found that Christian nationalism was the leading predictor that Americans engaged in risky behavior and ignored recommendations to avoid large crowds and public places, use facemasks and sanitizing or washing

hands. However, they also found that religious commitment promotes more prosocial values and was not related to incautious behavior after Christian nationalism has been controlled for. Our study also revealed substantial heterogeneity across religious groups in terms of behavioral responses to the pandemic.

Wildman et al. (2020) reported a number of examples including from South Korea, Trinidad, and Louisiana in the US where Christian churches have refused to comply with public corona restrictions. Pastor Tony Spell of the Life Tabernacle Church, a Pentecostal group in the US, continued to arrange large gatherings of people, without using facemasks. He claims that the shutdowns, mask mandates, and employer forced vaccinations are unlawful. He is facing six criminal charges in the High Court of the State but still defends the rights to shake hands and baptize over thousand people (Newsweek, 2022). His case is going to the Louisiana Supreme Court. The examples from different countries as well as our data seem to indicate that especially Pentecostals are likely to be against the public covid restrictions and think that their faith and prayer protect them against the evil virus. Wildman et al. (2020) argue that religion may not tell much about ethical judgments but the depth of religiosity can often predict the level of motivation and interest and religion makes ethical battles fiercer and the religious persons more confident about their views.

Religious leaders are influential in Malawi as most people are religious. As we should expect new waves of the pandemic and new corona variants that may be more dangerous than the omicron variant, it is important to find ways of ensuring broad vaccination of the Malawian population and involving religious leaders in achieving this can be a useful strategy that can reduce the burden of the disease.

8 Conclusions

We have studied the covid risk perceptions, information updating behavior related to the pandemic, use of protective measures, especially facemasks, and the demand for vaccines among university students in Malawi, and how religion and belief in prayer as a protective device against covid are affecting perceptions and behavior related to the pandemic. Our findings are from a stratified random sample of 764 students from 48 classes spread across different disciplines and study years. Our study reveals the extent to which religious affiliation and the belief in prayer as a protective device influence university students' beliefs and behavior related to the pandemic. The university is where academic influence and scientific thinking meets religious beliefs and cultural norms that the students carry with them to the university. Our study has shown that religious norms and beliefs persist and influence many students' perceptions and behavior related to the pandemic.

As much as 10% of the students believed that prayer was their most important measure to protect themselves against the pandemic. Students belonging to the Seventh Day Adventists (Baptist) and Pentecostal religions perceived the covid risk to be significantly lower than other students and those that considered prayer to be the most important protective device also perceived the covid risk to be

lower than others. These who believed in prayer as a protective device also updated themselves significantly less frequently about the status of the pandemic than other students while those that perceived their personal health to be at risk updated themselves more frequently about the pandemic. Furthermore, we found that the information updating frequency related to the pandemic and covid risk perceptions was positively correlated with facemask use, including facemask use in church. Those who believed in prayer as a protective device were using facemasks less frequently. Students belonging to the Seventh Day Adventists and Pentecostals were less likely to use facemasks in church. These two student groups represent close to 30% of our sample. Finally, we also found students belonging to these two groups to be less likely to have tried to get vaccinated or having gotten vaccinated and those who believed in prayer as a protective device were significantly less likely to have been vaccinated. These two groups are therefore at higher risk themselves in future corona waves and may also, due to their beliefs and behavior, enhance the spread of the virus. Our findings may be useful for targeting efforts to promote more corona safe behavior.

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Appendix: Survey instrument

Generated by steiho, Jan 11, 2022 09:45
Questionnaire created by patrick_kawaye, Jan 08, 2022 07:05
Last modified by steiho, Jan 11, 2022 09:45

Shared with:
samkatengeza (never edited)
steiho last edited 1/11/2022 8:45:04 AM
sarahtione (never edited)

Sections: 8, Sub-sections: 0, Questions: 116.
Questions with enabling conditions: 1
Questions with validation conditions:1
Rosters: 14
Variables: 0

SMARTEX_LUANAR_The_Corona_COVID19_pandemic

Basic information

Title SMARTEX_LUANAR_The_Corona_COVID19_pandemic

INTRODUCTION

Intro

STATIC TEXT

1. This is a NORAD (Norway)-funded project that is a collaboration between Norwegian University of Life Sciences and LUANAR 2. The project aims to build academic competence at LUANAR by giving courses, organizing joint data collection related to Climate Smart Agriculture and Policy Analysis in Malawi. 3. The Corona/COVID-19 pandemic is an important reality to take into account in the project both at LUANAR and in the study areas in Malawi. 4. This project component first aims to get insights about how students at LUANAR think and behave in relation to the pandemic, and second, to build on this insight in organizing fieldwork in rural areas in Malawi that makes a broader mapping of the perceptions, knowledge and behavior related to the pandemic, and third to train a team of enumerators that can carry out corona-safe fieldwork in rural parts of the country. 5. Participation in the survey (and experiments) is voluntary. All information will be treated as confidential and not disclosed to anyone unless in anonymized and aggregated form. 6. Try to give as honest answers as you can. We are not judging you, just try to map out general attitudes, knowledge, perceptions and behavior. 7. Participants can earn some money as participants. The amount of money will partly depend on the decisions of participants in some experiments as well as their luck in some lotteries. 8. The total time this session will take is about 1 hour 30 minutes. 9. You may as a participant also be asked to participate in new rounds in the future that are of similar nature. You will also then have the freedom to refuse to participate.

Consent Are you willing to participate in the survey and experiments

V1 Consent==1

M1 Thank the participant for their time

SINGLE-SELECT

Consent

01 ○ Yes

00 ○ No

DEMOGRAPHICS

Demographics

Interview Date	DATE: CURRENT TIME — Date .....
02.Age	DATE — Age .....
03.Sex	SINGLE-SELECT — Sex 01 ○ Female 00 ○ Male
04.Ethnic group	SINGLE-SELECT — Ethnic_group 01 ○ Chewa, 02 ○ Nyanja 03 ○ Yao 04 ○ Tumbuka 05 ○ Lomwe 06 ○ Nkhonde 07 ○ Ngoni 08 ○ Sena 09 ○ Nyakyusa 10 ○ Tonga 11 ○ Lambya 12 ○ Senga 13 ○ Sukwa 14 ○ English 15 ○ Other
05.Religion	SINGLE-SELECT — Religion 01 ○ Roman Catholic, 02 ○ Anglican 03 ○ Seventh Day Adventist/Baptist 04 ○ Central African Presbyterians, 05 ○ Pentecostal, 06 ○ Jehova's Witnesses, 07 ○ Mormonism (Church of Jesus Christ of Latter-Day Saints), 08 ○ Greek/Other Orthodox, 09 ○ Sunni Muslim, 10 ○ Buddhism, 11 ○ Hinduism, 12 ○ Other religion, specify: 13 ○ No religion
06.District of origin in Malawi	SINGLE-SELECT — District 101 ○ Chitipa, 102 ○ Karonga 103 ○ Nkhata Bay 104 ○ Rumphi 105 ○ Mzimba 106 ○ Likoma 107 ○ Mzuzu City 201 ○ Kasungu 202 ○ Nkhotakota 203 ○ Ntchisi 204 ○ Dowa 205 ○ Salima 206 ○ Lilongwe 207 ○ Mchinji 208 ○ Dedza 209 ○ Ntcheu And 16 other symbols [1]
07.Village name	TEXT — Village_name .....

08.Traditional Authority name	TEXT	TA
09.Mobile phone number	NUMERIC: INTEGER	Phone_number
10.Year of study	SINGLE-SELECT 01 ○ First year BSc 02 ○ Second year BSc 03 ○ Third year BSc 04 ○ Forth year BSc 05 ○ First year MSc 06 ○ Second year MSc	Year_of_study
11.Type of program	SINGLE-SELECT 01 ○ BSc 02 ○ Diploma 03 ○ MSc 04 ○ Others	Program_Type
If other specify	TEXT	SpecifyType
12.What is the name of the Study program you study?	SINGLE-SELECT 01 ○ BSc. in Agribusiness Management 02 ○ BSc. in Agriculture Economics 03 ○ BSc. in Agricultural Development Communication 04 ○ BSc. in Agricultural Education 05 ○ BSc. in Agricultural Enterprise Development and Microfinance 06 ○ BSc. in Agricultural Extension 07 ○ BSc. in Development Economics 08 ○ Diploma in Youth and Development 09 ○ Diploma in Gender and Development 10 ○ BSc. in Gender and Development 11 ○ BSc. in Food Science and Technology 12 ○ BSc. in Human Nutrition and Food Science 13 ○ BSc. in Human Sciences and Community Services 14 ○ BSc. in Agroforestry 15 ○ BSc. in Aquaculture and Fisheries Science 16 ○ BSc. in Forestry And 3 other symbols [2]	Program
12B.If others, specify E Program_Type==4	TEXT	Specify

FAMILY SITUATION

Family_situation

Question	Response
13.Marital status	SINGLE-SELECT Marital_status 01 ◯ Unmarried 02 ◯ Married 03 ◯ Separated 04 ◯ Divorced 05 ◯ Widowed
14.Number of children	NUMERIC: INTEGER Number_of_children _
15.Are your parents alive?	SINGLE-SELECT Parents 01 ◯ Yes, both are alive, 02 ◯ Father is dead but my mother is alive, 03 ◯ Mother has died but my father is alive, 04 ◯ Both are dead
16.Number of siblings	NUMERIC: INTEGER siblings _
17.Number of brothers	NUMERIC: INTEGER brothers _
18.Birth rank	NUMERIC: INTEGER birth_rank _
19.What is the primary source of income for your parents if alive?	SINGLE-SELECT income 01 ◯ Farming, 02 ◯ Government employment, 03 ◯ Private employment, 04 ◯ Private business, 05 ◯ Pension/Retired, 06 ◯ Skilled worker; Skill type: 07 ◯ Priest /religious leader, 08 ◯ Chief 09 ◯ Other 10 ◯ Parents have passed away
If others Specify	TEXT SpecifyInc ....
20.Are your parents farmland owners?	SINGLE-SELECT parent_land 01 ◯ Yes 00 ◯ No
21.If yes to q.20, farmland ownership holding size of parents	NUMERIC: INTEGER parents_farmland_size _
22.How do you fund your studies?	MULTI-SELECT study_funds 01 ☐ Help from parents, 02 ☐ Own job and income 03 ☐ Scholarship 04 ☐ Other
If others Specify	TEXT SpecifyFunds ....

FAMILY SITUATION

Roster: 23. MAIN SOCIAL ACTIVITIES/HOBBIES

generated by fixed list

hobbies

01 Sports
02 Religious activity
03 Stay with friends
04 Computer games
05 Reading

06 Music
07 Stay with family
08 Other

24.Rank your main social activities/hobbies (Rank by importance)	SINGLE-SELECT social_activities_rank 01 ○ Very important 02 ○ Important 03 ○ Less important 04 ○ Never
If others Specify	TEXT SpecifyHobbies .....
25. How frequently do you go to Church/religious building:	SINGLE-SELECT Religious_activity 01 ○ Daily 02 ○ More than once per week 03 ○ Once a week 04 ○ 1-3 times per month 05 ○ 1-10 times per year 06 ○ Less than one time per year
26. Are you an active member of a religious group?	SINGLE-SELECT relig_active_memb 01 ○ Yes 00 ○ /no
27.If yes to previous question, do you have a church position?	SINGLE-SELECT church_position 01 ○ Yes 00 ○ No
27B. what is your position	TEXT church_duty .....

KNOWLEDGE ABOUT THE CORONA PANDEMIC

K1. In which town and country was the virus causing COVID-19 first discovered?	TEXT Corona_town_country
K2.How many waves of the virus have you had in Malawi since 2019?	NUMERIC: INTEGER number_of_waves

KNOWLEDGE ABOUT THE CORONA PANDEMIC
Roster: VARIANTS OF THE CORONA VIRUS BY NAME
generated by fixed list vtype

01 Type 1
02 Type 2
03 Type 3

K3. Mention at least three different variants of the virus by name	TEXT Variant_name

KNOWLEDGE ABOUT THE CORONA PANDEMIC
Roster: COVID DEATH JANUARY
generated by fixed list covdeathfeb22

01 Exact number
02 Minmum
03 Maximum
04 No idea

K4.How many are known to have died from COVID-19 in Malawi up to February 2022?	NUMERIC: INTEGER COVdeathfeb22
K5.How many are known to have been infected by the corona virus in Malawi up to January 2022?	NUMERIC: INTEGER CVDinfectfeb22
K6. How many of the staff at LUANAR have died from COVID-19 up to February 2022?	NUMERIC: INTEGER COVstaffdeathfeb22
K7.How large % of the students at LUANAR do you know have been sick from COVID-19 since the beginning of the pandemic?	NUMERIC: INTEGER COVstud_sick
K8.How large % of the staff at LUANAR do you think have been vaccinated against COVID-19?	NUMERIC: INTEGER COVstaffvac
K9.How large % of the students at LUANAR do you think have been vaccinated against COVID-19?	NUMERIC: INTEGER COVstudentvac
K10.What have been the main sources of information on LUANAR COVID-19 status and update?	SINGLE-SELECT COVinfo 01 ○ University Administration public announcement, 02 ○ University staff personal info., 03 ○ Fellow students, rumors, 04 ○ Newpaper, 05 ○ Radio 06 ○ Internet: University webpage, 07 ○ Other
If others Specify	TEXT COVinfo_other
K11.Does vaccination against COVID-19 protect persons against being infected by the virus?	SINGLE-SELECT vacprotinf 01 ○ Yes 00 ○ No 02 ○ Don't know

K12.Does vaccination against COVID-19 protect persons from getting seriously sick?	SINGLE-SELECT vac_prot_sick 01 ○ Yes 00 ○ No 02 ○ Don't know

KNOWLEDGE ABOUT THE CORONA PANDEMIC

Roster: VACCINES THAT WORK

generated by fixed list vac_names

01 Vaccine 1

02 Vaccine 2

03 Vaccine 3

04 Vaccine 4

K13.Which vaccines do you know about that work against COVID-19? Give names of vaccines	TEXT vcn_that_wrk .....

PERCEPTION QUESTIONS RELATED TO THE PANDEMIC

P1.Do you perceive COVID-19 represents a serious risk to your personal health?	SINGLE-SELECT COVriskpercep 01 ○ Yes 00 ○ No 02 ○ Don't know
P2. If yes to P1, why, explain	TEXT COVriskexplainperc .....
P3. If no to P1, explain	TEXT COVnoriskexplainperc .....
P4.Do you perceive it as important for your own health to vaccinate yourself against COVID-19?	SINGLE-SELECT vac_percep_imp 01 ○ Yes 00 ○ No 02 ○ Don't know

PERCEPTION QUESTIONS RELATED TO THE PANDEMIC
Roster: PROTECTION FROM CORONA
generated by fixed list

protection from corona

01 Used facemask,
02 Kept >1 meter distance to people in public spaces,
03 Reduced the number of contact persons,
04 Washed my hands many times per day,
05 Avoided handshakes,
06 Avoided crowded places
07 Used disinfectants regularly
08 Prayed to God to not get infected
09 Traditional medicine
10 Other, explain

P5. Which of these methods protect against getting infected by the corona virus?	SINGLE-SELECT protection_methods 01 ○ Yes 00 ○ No 02 ○ Don't know
P6. Rank the three most important methods above by their importance	SINGLE-SELECT protection_methods_rank 01 ○ Most important 02 ○ Second most important 03 ○ Third most important
If others Specify	TEXT SpecifyRank .....
P7.What do you think are the main positive and/or negative effects of vaccination against COVID-19 are?	MULTI-SELECT vac_main_eff 01 ☐ Reduced risk of getting infected 02 ☐ Reduced risk of getting seriously sick or die 03 ☐ Higher risk of getting infected 04 ☐ Higher risk of getting sick and or die 05 ☐ No effect 06 ☐ Depends on the type of vaccine Uncertain: 07 ☐ Depends on how the individual reacts to the vaccine (age and health condition) 08 ☐ Depends on the type of the vaccine 09 ☐ Depends on the type of corona virus 10 ☐ Other, specify:
P7B. If others specify	TEXT other_methods .....

PERCEPTION QUESTIONS RELATED TO THE PANDEMIC
Roster: VULNERABILITY
generated by fixed list

vun_age

01 People elder than 80 years
02 People 60-80 years old
03 People 40-60 years old
04 People 20-40 years old
05 People 0-20 years old
06 People that are overweight
07 People with other diseases
08 Anybody can get seriously sick

P8. Who do you think are more vulnerable if they get infected by the corona virus? Consider the following groups if not vaccinated

SINGLE-SELECT vulnerability

01 ○ Most vulnerable
02 ○ Second most vulnerable
03 ○ Third most vulnerable
04 ○ Not vulnerable

VACCINATION AGAINST COVID-19 AND INFECTIONS/SICKNESS

V1.Have you already been vaccinated against COVID-19?	SINGLE-SELECT vac_cov19 01 ○ Yes 00 ○ No
V2. If yes to V8, what type of vaccine?	MULTI-SELECT COVvac_type 01 ☐ Astra Zeneca, 02 ☐ Johnson&Johnson, 03 ☐ Pfizer, 04 ☐ Other, name:
If others Specify	TEXT SpecifyVaccinename ....
V3.If yes to V8, how many doses have you received?	NUMERIC: INTEGER COVvac_doses _
V4. If yes to V8, when were you vaccinated first time?	DATE COVvac_date_first ....
V5. If yes to V8, where were you vaccinated?	SINGLE-SELECT COVvac_location_first 01 ○ 1=At LUANAR, 02 ○ 2=At my home place, 03 ○ 3=Other, specify:
If others Specify	TEXT COVvacSpecifyplace ....
V6. If you are not vaccinated, have you tried to get vaccinated?	SINGLE-SELECT COV_vac_tried 01 ○ Yes 00 ○ No
V7.Would you like to get vaccinated against COVID-19?	SINGLE-SELECT liketoget_vac 01 ○ Yes 00 ○ No 02 ○ Don't know
V8. Does your answer to V7 depend on the type of vaccine you get access to?	SINGLE-SELECT vcn_vs_type 01 ○ Yes 00 ○ No
V8a. If Yes to question V8, explain:	TEXT COVvac_explain ....
V9.Do you recommend all adults to get vaccinated?	SINGLE-SELECT COVvacrecom 01 ○ Yes 02 ○ No
V10. Would you like to warn people against getting vaccinated against COVID-19?	SINGLE-SELECT COVvacwarning 01 ○ Yes 00 ○ No
V11. If yes to V5, explain why:	TEXT why_COVvac_warn ....
V12.Should vaccines be reserved for only some groups that should be given first priority?	SINGLE-SELECT COVvac_priority 01 ○ Yes 00 ○ No

VACCINATION AGAINST COVID-19 AND INFECTIONS/SICKNESS

Roster: COV VACCINE PRIORITY GROUPS

generated by fixed list COVvac_prigroup

01 People elder than 80 years
02 People 60-80 years old
03 People 40-60 years old
04 People 20-40 years old

05 People 0-20 years old
06 People that are overweight
07 People with other diseases
08 Anybody can get seriously sick

V13. If yes to V6, who should be given priority?	SINGLE-SELECT 01 ○ Yes 00 ○ No	COVvacprigroups
V14.Have you been infected by the corona virus at some point as far as you know?	SINGLE-SELECT 01 ○ Yes 00 ○ No	CoronaInfected
V14a.If yes to V14, how did the infection affect your body?	SINGLE-SELECT 00 ○ I did not feel any effect 01 ○ I felt only mild symptoms 02 ○ I felt ill and uncomfortable 03 ○ I got seriously sick but did not go to hospital 04 ○ I got very sick and was hospitalized	
V15.If yes to V14, when was this?	DATE	MonthInfected
V16.Have you at some points in time tested yourself for being infected?	SINGLE-SELECT 01 ○ Yes 00 ○ No	Coronatested
V17.If yes to V16, how many times?	NUMERIC: INTEGER _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	Coronatesttimes
V18.If yes to V16, where was this?	TEXT	Coronatestplace

VACCINATION AGAINST COVID-19 AND INFECTIONS/SICKNESS

Roster: TIMES FOR CORONA TESTS

generated by fixed list

Times for corona tests

01 First time
02 Second time
03 Third time

V19.If yes to V16, when was this?	NUMERIC: INTEGER _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	time_coronatest
If others Specify	TEXT	SpecifySick
V22.Do you have any friends who have been infected by corona?	SINGLE-SELECT 01 ○ Yes 00 ○ No	COVsickfriend
V23.If yes to V22, have any of these been seriously sick?	SINGLE-SELECT 01 ○ Yes 00 ○ No	COVsickfriendsserious
V24. Do you have any relatives who have been infected?	SINGLE-SELECT 01 ○ Yes 00 ○ No	COVsickrelatives
V25.If yes to V24, have any of these been seriously sick?	SINGLE-SELECT 01 ○ Yes 00 ○ No	COVsickreativserious
V26. Do you know anybody who have died from COVID-19?	SINGLE-SELECT 01 ○ Yes 00 ○ No	COVdied_know
V27. Have you lived with a person that have been infected by the corona virus?	SINGLE-SELECT 01 ○ Yes 00 ○ No	coronainfcohabit

PERSONAL BEHAVIOR IN RESPONSE TO THE PANDEMIC

Roster: 23. PERSONAL BEHAVIOR

generated by fixed list

person_beh

01 Used facemask,
02 Kept >1 meter distance to people in public spaces,
03 Reduced the number of contact persons,
04 Washed my hands many times per day,
05 Avoided handshakes,
06 Avoided crowded places
07 Avoided visiting old people/family
08 Prayed to God to not get infected
09 Used traditional medicine
10 Other

B1.What have you done to try to avoid getting infected by the corona virus during the most recent wave of the pandemic? Go through and tick for the items used first. Rank the three most important afterwards	SINGLE-SELECT Corona_protection_rank 01 ○ Very important 02 ○ Important 03 ○ Less important 04 ○ NA
B2.How good were you at practicing each of the stated ranked rules you followed above at the height of the last wave of the pandemic? On a Likert scale from 1 to 5:	SINGLE-SELECT B2 01 ○ Always, 02 ○ Almost always, 03 ○ Most of the time, 04 ○ Sometimes, 05 ○ Almost never or never
If others Specify	TEXT CorprototherSp .....
B3. If you used facemask regularly during the peak of the last wave of the pandemic, how many times did you use such a mask before you disposed it?	SINGLE-SELECT facemaskchange 01 ○ 1-5 times, 02 ○ 6-10 times, 03 ○ 11-20 times, 04 ○ >20 times 05 ○ Changed mask daily 06 ○ Other
B4. What kind of facemask did you use?	SINGLE-SELECT facemasktype 01 ○ Purchased paper mask, 02 ○ Washable cloth mask, 03 ○ Homemade mask from cotton, 04 ○ Other, specify:
If others Specify	TEXT facemasktypesp .....
B5.What are the main benefits of using facemask?	MULTI-SELECT facemaskbenefit 01 ☐ Protect yourself from being infected by others, 02 ☐ Protecting others from being infected by you, 03 ☐ You are safe when you go to crowded places, 04 ☐ You do not need to think about social distancing 05 ☐ Others
If others Specify	TEXT facemaskbenefitspec .....

B6. If you used a washable facemask that you used many times, how often did you wash it during the peak of the pandemic?

MULTI-SELECT facemaskwash

- 01 ☐ Daily,
- 02 ☐ Twice per week
- 03 ☐ Once per week
- 04 ☐ Rarely
- 05 ☐ Never

PERSONAL BEHAVIOR IN RESPONSE TO THE PANDEMIC

Roster: FACEMASK USE

generated by fixed list facemaskuse

- 01 In stores/shops,
- 02 At friends home,
- 03 In the street,
- 04 In the bus,
- 05 In the market,
- 06 At home,
- 07 In the university,
- 08 In the classroom,
- 09 In church,
- 10 Other

B7.What have you done to try to avoid getting infected by the corona virus during the most recent wave of the pandemic? Go through and tick for the items used first. Rank the three most important afterwards

SINGLE-SELECT facemaskuse

- 01 ○ Yes
- 00 ○ No
- 02 ○ Sometimes

PERSONAL BEHAVIOR IN RESPONSE TO THE PANDEMIC

Roster: ADJUSTMENTS_IN_BEHAVIOR

generated by fixed list adjustments_in_behavior

- 01 Used facemask,
- 02 Kept >1 meter distance to people in public spaces,
- 03 Reduced the number of contact persons,
- 04 Washed my hands many times per day,
- 05 Avoided all handshakes,
- 06 Avoided crowded places
- 07 Used disinfectants regularly
- 08 Avoided visiting parents and grandparents to not infect them
- 09 Avoided visiting other old or sick people
- 10 Avoid going to church

B8.Rank your three most important behavioral activities to protect yourself against getting infected by the corona virus

MULTI-SELECT rankprotectact

- 01 ☐ Most imprortant protection activity
- 02 ☐ Second most important protection activity
- 03 ☐ Third most important protection activity

B8.Have you made any adjustments in your behavior to reduce the risk that you will infect others in case you are infected without knowing it? Things you did during the height of the most recent wave of the pandemic to protect others

SINGLE-SELECT B8

- 01 ○ Yes
- 00 ○ No

B9.Do you think it is necessary for you to adjust your behavior due to the corona pandemic?

SINGLE-SELECT B9

- 01 ○ Yes
- 00 ○ No

PERSONAL BEHAVIOR IN RESPONSE TO THE PANDEMIC

Roster: REASONS NO ADJUSTED BEHAVIOR

generated by fixed list Reasons no adjusted beh

- 01 Very low or no risk of getting infected
- 02 Very low or no risk of getting sick if infected
- 03 No or very low risk of infecting others
- 04 I do not want to adjust my behavior as I should be free to do whatever I want
- 05 I do not think I am at risk myself and others should take care of themselves, that is not my responsibility
- 06 Other

B10.If No to B4, what are the reasons? Rank by importance

SINGLE-SELECT ranknoadjustreasons

01 ○ Most important
02 ○ Second most important
03 ○ Third most important

B11.How frequently did you update yourself on the pandemic situation in the country during the last wave? If yes, how often?

SINGLE-SELECT B11

01 ○ Daily
02 ○ Weekly
03 ○ Monthly
04 ○ I do not make any special efforts to be updated on this
05 ○ I expect others to inform me or warn me if important

PERSONAL BEHAVIOR IN RESPONSE TO THE PANDEMIC

Roster: SOURCES OF INFORMATION ABOUT THE PANDEMIC

generated by fixed list sources_of_info_pandemic

01 Radio
02 TV
03 Newspapers
04 Internet
05 Religious leaders
06 Political leaders
07 Health personell
08 Other

B12.If you update yourself regarding the pandemic, what are your main sources of information? (Rank by importance)

SINGLE-SELECT pandemicinfosources

01 ○ Very important
02 ○ Important
03 ○ Less important
04 ○ Not used

B13.If internet is an important source of information, which websites are your main sources of information? Websites:

TEXT pandem_internetsources

.....

PERSONAL BEHAVIOR IN RESPONSE TO THE PANDEMIC

Roster: MOST RESPECTED INFO SOURCES

generated by fixed list Respect_of_info_source

01 Religious leader,
02 Political leaders
03 Health personnel,
04 University leaders,
05 Parents,
06 Best friends,
07 Other

B14.Who do you respect/trust the most and follow the advice of in relation to the pandemic? Rank the three most respected on list

SINGLE-SELECT rankinfosourcetrust

01 ○ Most respected/trusted
02 ○ Second most respected/trusted
03 ○ Third most respected/trusted

If others Specify

TEXT Otherinfosourcesp

.....

PERCEPTION ABOUT THE BEHAVIOR OF OTHERS RELATED TO THE PANDEMIC

O1. Do you think that other students behave in a responsible way in relation to the pandemic?	SINGLE-SELECT O1_othstudbehav 01 ○ Yes 00 ○ No
O2.how big share of the students at LUANAR do you think are too careless and can therefore contribute to the spread of the virus?	SINGLE-SELECT O2_careless_stud 01 ○ 1-20% 02 ○ 21-40% 03 ○ 41-60%, 04 ○ 61-80%, 05 ○ 81-100%
O3.How big share of the students are against the recommended protective measures?	SINGLE-SELECT O3_studagainstprotact 01 ○ 1-20% 02 ○ 21-40% 03 ○ 41-60%, 04 ○ 61-80%, 05 ○ 81-100%
O4.How big share of the students are against getting vaccinated against COVID-19?	SINGLE-SELECT O4_sharestudantivac 01 ○ 1-20% 02 ○ 21-40% 03 ○ 41-60%, 04 ○ 61-80%, 05 ○ 81-100%
O5.How big share of the students are believing that their religion/God protects them against the pandemic	SINGLE-SELECT O5_studreligprot 01 ○ 1-20% 02 ○ 21-40% 03 ○ 41-60%, 04 ○ 61-80%, 05 ○ 81-100%
O6.How big share of the students believe that the vaccine is more dangerous than the corona virus itself?	SINGLE-SELECT O6_COVvacriskiercorona 01 ○ 1-20% 02 ○ 21-40% 03 ○ 41-60%, 04 ○ 61-80%, 05 ○ 81-100%
O7.How big share of the students believe that the corona virus is no serious threat to them and therefore ignore it?	SINGLE-SELECT O7 coronanothreat 01 ○ 1-20% 02 ○ 21-40% 03 ○ 41-60%, 04 ○ 61-80%, 05 ○ 81-100%
O8.How big share of the students believe that traditional medicines are better at protecting against corona infection/COVID-19 than the vaccines?	SINGLE-SELECT O8_sharestudtradmedicine 01 ○ 1-20% 02 ○ 21-40% 03 ○ 41-60%, 04 ○ 61-80%, 05 ○ 81-100%
O9.Are there some special events that have changed your opinion/attitudes/behavior about the corona pandemic/COVID-19 risk?	SINGLE-SELECT O9_specialeventseffect 01 ○ Yes 00 ○ No
O10.If yes to O10, what was this event or events that changed your attitudes/opinion/behavior? Explain	TEXT O10_whatevents .....

APPENDIX A — CATEGORIES

[1] District: 06.District of origin in Malawi
Categories: 101:Chitipa,, 102:Karonga, 103:Nkhata Bay, 104:Rumphi, 105:Mzimba, 106:Likoma, 107:Mzuzu City, 201:Kasungu, 202:Nkhotakota, 203:Ntchisi, 204:Dowa, 205:Salima, 206:Lilongwe, 207:Mchinji, 208:Dedza, 209:Ntcheu, 210:Lilongwe City, 301:Mangochi, 302:Machinga, 303:Zomba, 304:Chiradzulu, 305:Blantyre, 306:Mwanza, 307:Thyolo, 308:Mulanje, 309:Phalombe, 310:Chikwawa, 311:Nsanje, 312:Balaka, 313:Neno, 314:Zomba City, 315:Blantyre City

[2] Program: 12.What is the name of the Study program you study?
Categories: 1:BSc. in Agribusiness Management, 2:BSc. in Agriculture Economics, 3:BSc. in Agricultural Development Communication, 4:BSc. in Agricultural Education, 5:BSc. in Agricultural Enterprise Development and Microfinance, 6:BSc. in Agricultural Extension, 7:BSc. in Development Economics, 8:Diploma in Youth and Development, 9:Diploma in Gender and Development, 10:BSc. in Gender and Development, 11:BSc. in Food Science and Technology, 12:BSc. in Human Nutrition and Food Science, 13:BSc. in Human Sciences and Community Services, 14:BSc. in Agroforestry, 15:BSc. in Aquaculture and Fisheries Science, 16:BSc. in Forestry, 17:BSc. in Environmental Science, 18:BSc. in Natural Resources Management (Land and Water), 19:other

Legend and structure of information in this file